

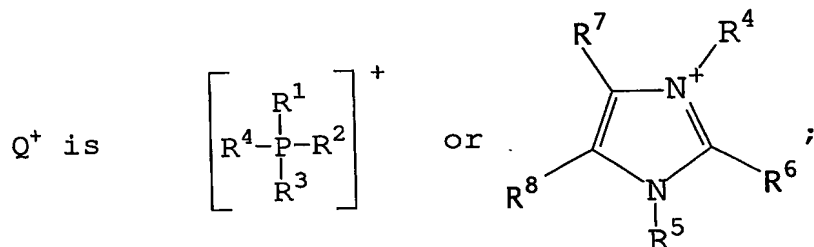
CLAIMS:

1. A compound having the general formula (I):



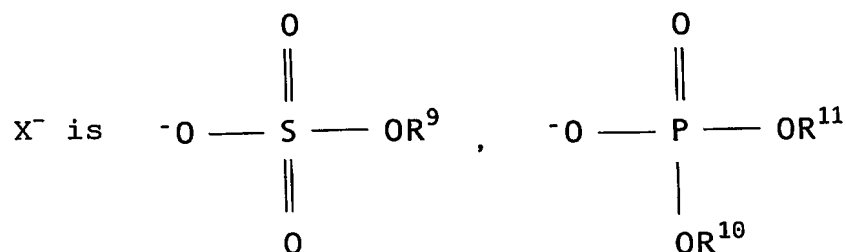
wherein

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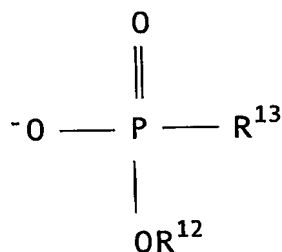


and

10



or



15 and wherein:

each of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^9$ ,  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  is independently a hydrocarbyl group;

each of  $R^6$ ,  $R^7$  and  $R^8$  is independently a hydrogen or a hydrocarbyl group;

20 with the provisoes that:

(i) when  $Q^+$  is a phosphonium cation and  $X^-$  is a phosphate, or a phosphonate anion other than a phosphonate in

which  $R^{13}$  is perfluorohydrocarbyl, then  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  each has three or more carbon atoms;

(ii) when  $Q^+$  is a phosphonium cation and  $X^-$  is a sulfate then the sum of carbon atoms in  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is  
5 greater than 4;

(iii) when  $Q^+$  is an imidazolium cation,  $X^-$  is not a sulfate anion; and

(iv) when  $Q^+$  is a phosphonium cation,  $X^-$  is methylsulfate, and one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is methyl, the  
10 others of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  cannot be 2-cyanoethyl.

2. A compound according to claim 1, wherein  $Q^+$  is a tetralkylphosphonium and  $X^-$  is an alkylsulfate anion.

3. A compound according to claim 2, wherein  $R^1$ ,  $R^2$ , and  $R^3$  are hydrocarbyl groups with three or more carbon atoms.

15 4. A compound according to claim 2, wherein  $R^1$ ,  $R^2$ , and  $R^3$  are each n-butyl.

5. A compound according to any one of claims 2 to 4, wherein:

(a)  $R^4$  is methyl and  $R^6$  is methyl; or

20 (b)  $R^4$  is ethyl and  $R^6$  is ethyl; or

(c)  $R^4$  is n-butyl and  $R^6$  is n-butyl.

6. A compound according to claim 1, wherein the compound is selected from the group consisting of

tri-(n-butyl)methylphosphonium methylsulfate;

25 tri-(n-butyl)ethylphosphonium ethylsulfate;

tetra-(n-butyl)phosphonium n-butylsulfate;

triethyl-(n-butyl)phosphonium n-butylsulfate;

tetrabutylphosphonium dibutylphosphate;

tri-iso-butyl-butylphosphonium dibutylphosphate

N,N-dimethylimidazolium dimethylphosphate;

N-methyl-N-butylimidazolium dibutylphosphate; and

N-methyl-N-ethylimidazolium ethylethanephosphonate;

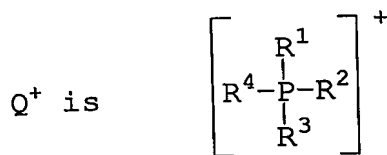
and

tributylmethylphosphonium  
methyltrifluoromethanephosphonate.

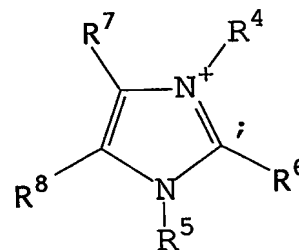
7. A process for preparing a compound of formula (I):



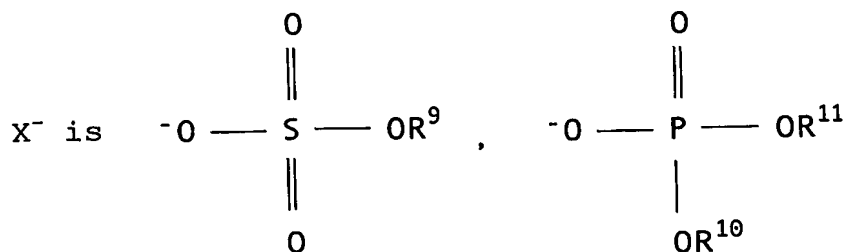
wherein



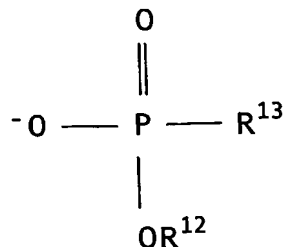
or



and



or



and wherein:

each of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^9$ ,  $R^{10}$ ,  $R^{11}$ ,  $R^{12}$ , and  $R^{13}$  is independently a hydrocarbyl group;

each of  $R^6$ ,  $R^7$ , and  $R^8$ , is a hydrogen or hydrocarbyl  
5 group;

with the provisoes that:

(i) when  $Q^+$  is a phosphonium cation and  $X^-$  is a phosphate, or a phosphonate anion other than a phosphonate in which  $R^{13}$  is perfluorohydrocarbyl, then  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  each  
10 has three or more carbon atoms;

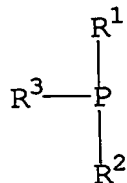
(ii) when  $Q^+$  is a phosphonium cation and  $X^-$  is a sulfate then the sum of carbon atoms in  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is greater than 4;

(iii) when  $Q^+$  is an imidazolium cation,  $X^-$  is not a  
15 sulfate; and

(iv) when  $Q^+$  is a phosphonium cation,  $X^-$  is methylsulfate, and one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  is methyl, the others of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  cannot be 2-cyanoethyl.

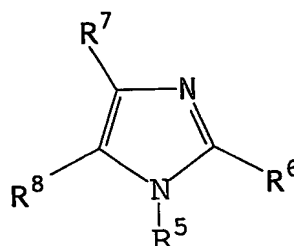
the process comprising reacting a compound of formula (II):

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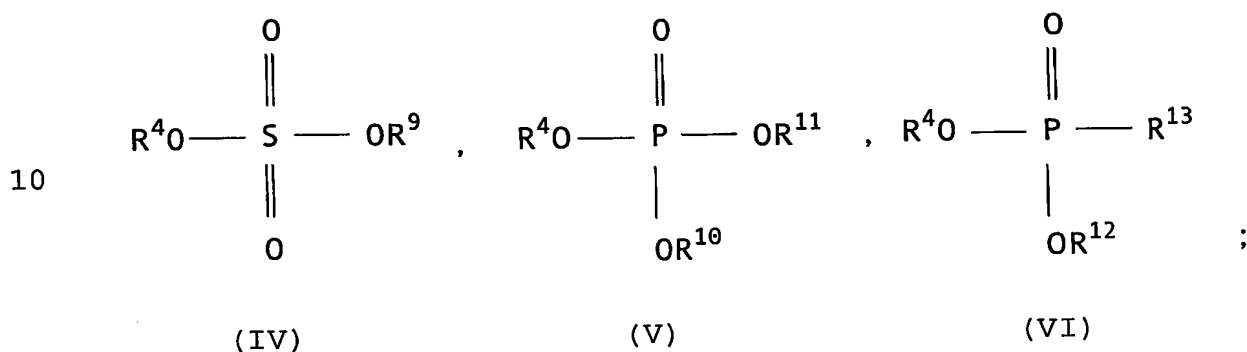
wherein each of  $R^1$ ,  $R^2$ , and  $R^3$  is independently a hydrocarbyl group, or formula (III):

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5 wherein  $R^5$  is a hydrocarbyl group, and cation of  $R^6$ ,  $R^7$  and  $R^8$  is independently a hydrogen or hydrocarbyl group,

with a compound defined by one of the following formulae:



wherein each of  $R^4$ ,  $R^9$ ,  $R^{10}$ ,  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  is a hydrocarbyl group.

15 8. The process of claim 7, wherein the reaction is carried out in the absence of solvent.

9. The process of claim 7, wherein  $Q^+$  is a tetralkylphosphonium and  $X^-$  is an alkylsulfate anion.

10. The process of claim 9, wherein  $R^1$ ,  $R^2$ , and  $R^3$  are  
20 hydrocarbyl groups with three or more carbon atoms.

11. The process of claim 9, wherein  $R^1$ ,  $R^2$ , and  $R^3$  are each n-butyl.

12. The process of any one of claims 7 to 11, wherein

(a)  $R^4$  and  $R^6$  are both methyl; or

(b)  $R^4$  and  $R^6$  are both ethyl; or

(c)  $R^4$  and  $R^6$  are both n-butyl.

13. The process of claim 7 or 8, wherein the compound of formula (I) is selected from the group consisting of

- 5 tri-(n-butyl)methylphosphonium methylsulfate;  
tri-(n-butyl)ethylphosphonium ethylsulfate;  
tetra-(n-butyl)phosphonium n-butylsulfate;  
triethyl-(n-butyl)phosphonium n-butylsulfate;  
tetrabutylphosphonium dibutylphosphate;  
10 tri-iso-butyl-butylphosphonium dibutylphosphate  
N,N-dimethylimidazolium dimethylphosphate;  
N-methyl-N-butylimidazolium dibutylphosphate; and  
N-methyl-N-ethylimidazolium ethylethanephosphonate;  
and  
15 tributylmethylphosphonium  
methyltrifluoromethanephosphonate.